

**IMPROVED SOFT-DECISION METRIC GENERATION  
FOR HIGHER ORDER MODULATION**

**ABSTRACT OF THE DISCLOSURE**

5           A method (100) for simplifying soft-decision metric decisions in a M-ary  
modulation system includes determining (102) a single function for a soft-decision metric  
for each bit in a symbol by restricting the set of all possible Gray-coded constellation  
points to those closest to a boundary between a bit value of 0 and 1 for each bit in the  
input symbol and applying a predetermined function corresponding to the range of  
10 restricted constellation points to the entire possible range of symbols. A next step  
includes inputting (104) a symbol having real part,  $x$ , and an imaginary part,  $y$ . A next  
step includes (106) setting a soft-decision metric for each bit in the symbol using the  
predetermined function from the determining step (102).